## REMARKS

Claims 1-6 are pending in this application. By this Amendment, claims 1-6 are amended. Support for the amendments to the claims may be found, for example, in the specification at page 7, lines 9-20; page 8, line 24 to page 9, line 13; and page 18, line 24 to page 19, line 16. No new matter is added.

In view of the foregoing amendments and following remarks, reconsideration and allowance are respectfully requested.

### I. Personal Interview

The courtesies extended to Applicants' representative by Examiner Paden at the interview held June 11, 2009, are appreciated. The reasons presented at the interview as warranting favorable action are incorporated into the remarks below, which constitute Applicants' record of the interview.

### II. Rejection Under 35 U.S.C. §103

The Office Action rejects claims 1-6 under 35 U.S.C. §103(a) as obvious over the combination of JP 2000-308469 to Shunsuke et al. ("Shunsuke"), U.S. Patent No. 5,976,587 to Yamauchi et al. ("Yamauchi"), JP 2000-210048 to Toru et al. ("Toru"), "Active Food Packaging" edited by M.L. Rooney ("Rooney"), and the allegedly admitted state of the art. Applicants respectfully traverse the rejection.

By this Amendment, claims 1 and 5 are amended to recite a container-packed, oil-in-water emulsified food product that has the following combination of features: (1) the oil-in-water emulsified food comprised of edible oil and fat, vinegar, and egg yolk has a dissolved oxygen concentration of 0.8 to 8.1 $\%O_2$; (2) the edible oil and fat are deoxygenated (claim 1) or subjected to a deoxygenation treatment (claim 5); (3) the oil-phase starting material is 30 to 80 wt% of the food; and (4) the food is packed and sealed in a container having an average

oxygen permeability of 50 $cc/m^2 \cdot day \cdot atm$ or less. The combination of applied references does not disclose and would not have rendered obvious this combination of claim features.

**A. Applied References**

Instead, Shunsuke discloses removing oxygen-containing air from the head-space of a container storing a mayonnaise-like food and replacing the air with nitrogen. See Shunsuke at paragraphs [0003] and [0025]. Shunsuke does not disclose replacing the oxygen dissolved in the mayonnaise-like food itself with, for example, nitrogen gas. Thus, the food would have a dissolved oxygen concentration of 10 to 15 $\%O_2$, which is the expected dissolved oxygen concentration for this type of food if not purposefully adjusted. See, e.g., specification at page 3, lines 13-16.

Similarly, Yamauchi discloses storing mayonnaise in an oxygen-free bottle. See Yamauchi at abstract. By "oxygen free," Yamauchi discloses that the empty space in the bottle is filled with nitrogen or, in other words, the air in the empty space of each bottle is replaced with nitrogen. See Yamauchi at column 4, lines 49-53 ("The empty space . . . of each bottle . . . is filled with nitrogen in order to protect the mayonnaise from being deteriorated."). Similar to Shunsuke, Yamauchi also does not disclose replacing the oxygen dissolved in the mayonnaise with nitrogen. Thus, the mayonnaise would have a dissolved oxygen concentration of 10 to 15 $\%O_2$.

Toru is directed to whipped, oil-in-water emulsified foods, such as mayonnaise and salad dressing. See Toru at paragraphs [0002] and [0007]. The whipped, emulsified foods are prepared by bubbling water-phase components with, for example, nitrogen and performing an emulsification while adding oil, such as salad oil, to the water-phase and bubbling with, for example, nitrogen. See Toru at paragraphs [0007] and [0019]. Toru does not disclose using nitrogen gas to replace the dissolved oxygen in the emulsified foods. To

the contrary, Toru discloses that air may be used to bubble the water-phase components, although it is not preferred. See Toru at paragraph [0007].

Furthermore, in the working Examples of Toru, the salad oil itself is not deoxygenized by bubbling with nitrogen. See, e.g., Toru at paragraphs [0019]. Toru discloses that the emulsification is performed by gradually adding salad oil into the water-phase components while vigorously mixing. Id. By adding the salad oil to the water-phase components, the salad oil is dispersed as small disperoids in the water-phase and these oil disperoids are quickly covered by the egg yolk as the emulsifier. Thus, during emulsification with nitrogen bubbling, nitrogen bubbles would not directly contact the oil disperoids because the egg yolk would serve to shield the oil disperoids. Besides, nitrogen bubbles are larger than the oil disperoids and, thus, could not displace the oxygen within the oil disperoids.

Thus, Toru does not disclose deoxygenated edible oil and fat and the emulsified food would have a dissolved oxygen concentration of 10 to 15 $\%O_2$ because the amount of the oil-phase starting materials and the dissolved oxygen concentration for that food share a strong correlation. This is because edible oils dissolve much more oxygen by mass than water.

For clarification, it is true that when oxygen partial pressure is used as the basis for measuring the dissolved oxygen concentration in solvents, the measured value does not depend on the type of solvent used. However, when dissolved oxygen concentration is measured by mass (e.g., ppm), the dissolved oxygen concentration in edible oils is about four times the concentration of that of pure water at saturation levels. See Table (attached). Thus, if the oil is not deoxygenated in an oil-in-water emulsified food, the dissolved oxygen concentration would be 10 to 15 $\%O_2$.

Rooney, which the Office Action only applies for teaching containers having an oxygen barrier, fails to cure the deficiencies of Shunsuke, Yamauchi, and Toru with respect to claims 1 and 5. See Office Action at page 3. Thus, the combination of applied references

does not disclose and would not have rendered obvious an oil-in-water emulsified food comprised of edible oil and fat, vinegar, and egg yolk having a dissolved oxygen concentration of 0.8 to 8.1 $\%O_2$ in which the edible oil and fat are deoxygenated.

**B. Immediately After Manufacturing**

During the interview, the Examiner pointed out that the specification describes "immediately after manufacturing" to mean "the manufacturing day or the next day." See the specification at page 6, lines 3-5. The Examiner asserted that the whipped, oil-in-water emulsified foods disclosed by Toru would have the claimed dissolved oxygen concentration of 0.8% to 8.1% by the next day after manufacturing even if not initially within the claimed range. As discussed above, the oil-in-water emulsified foods disclosed by Toru would have an initial dissolved oxygen concentration of 10 to 15 $\%O_2$. As evidenced by the specification at Table 4 (page 32), an oil-in-water emulsified food that has a dissolved oxygen concentration of 9.6% immediately after manufacturing would have a dissolved oxygen concentration of 8.5% when measured ten days after manufacturing. Accordingly, the emulsified foods disclosed by Toru with a higher initial dissolved oxygen concentration would be expected to have a dissolved oxygen concentration greater than 8.5% if measured ten days after manufacturing. Because a dissolved oxygen concentration of 8.5% is outside the claimed range and ten days is much longer than a day after manufacturing, Toru would not be expected to disclose an oil-in-water emulsified food having the claimed dissolved oxygen concentration "immediately after manufacturing."

**C. Applicants Discovered an Unexpected Problem and Provide a Solution thereto**

Furthermore, Applicants discovered the source of the problem solved by the claimed food product. This is part of "the subject matter as a whole" that must be considered by the Examiner. See MPEP §2141.

At most, an ordinarily skilled artisan, using common sense, would have removed all dissolved oxygen from an oil-in-water emulsified food to obtain an emulsified food that has excellent taste after storage. Common sense in the art would have dictated that it is the oxidation of, for example, edible oil and fat that provides an undesired taste to the emulsified food. By removing all the dissolved oxygen from the emulsified food, common sense would thus have led one to believe that the desired taste would be preserved after storage because oxidation of edible oil and fat, as well as other components of the foods, would be completely prevented. Although one would have expected that the complete removal of dissolved oxygen would have preserved taste after storage, the major reason that the removal of all dissolved oxygen from oil-in-water emulsified foods has not been carried out on a commercial scale is because it greatly increases production costs. See specification at page 2, lines 21-26.

To test the conventional wisdom in the art, Applicants conducted studies in which they prepared oil-in-water emulsified foods that had the dissolved oxygen removed to such an extent as to be effectively 0 $\%O_2$ (e.g., 0.4 $\%O_2$). See specification at page 28, line 24 to page 32, line 11 (Test Examples 1 and 2). This did predictably prevent oxidation of the edible oil and fat, as well as other components of the foods, and any resulting loss in taste due to oxidation during storage. Id. (Tables 3 and 4).

Unexpectedly, however, the emulsified foods were found to have a pungent vinegar flavor. The pungent vinegar flavor was present in the emulsified food immediately after preparation and also after storage. Although the food comprises vinegar, its flavor was intended to be balanced to provide a much more subtle flavor. The greater degree of vinegar flavor present after the effective removal of all dissolved oxygen is an unwanted flavor in the emulsified food and caused the emulsified food, as a whole, to lack a balanced flavor. Applicants have theorized that the pungent vinegar flavor results from insufficient dispersion

of the acetic acid molecules present in the vinegar throughout the emulsified food such that the acetic acid molecules form aggregates that produce a stronger-than-wanted vinegar flavor. See specification at page 17, lines 7-16.

Applicants provide a solution to this newly-discovered problem associated with the pungent vinegar flavor and, at the same time, address the loss of flavor due to excess oxidation. That is, the claimed food product is able to (1) reduce taste degradation after storage by reducing oxidation of the oil-in-water emulsified food during storage, and (2) avoid a pungent vinegar flavor immediately after preparation and also after storage. See, e.g., specification at page 21, line 16 to page 32, line 11 (Working Examples 1, 2, and 3 and Test Examples 1 and 2).

The claimed food product is able to achieve both as a result of the following combination of features: (1) the oil-in-water emulsified food comprised of edible oil and fat, vinegar, and egg yolk has a dissolved oxygen concentration of 0.8 to 8.1 $\%O_2$; (2) the edible oil and fat are deoxygenated; (3) the oil-phase starting material is 30 to 80 wt% of the food; and (4) the food is packed and sealed in a container having an average oxygen permeability of 50 cc/m2·day·atm or less. Thus, the results achieved by the claimed food product are unexpected over the prior art because the prior art does not disclose these claim features and would not have led one of ordinary skill in the art to develop a food product having these claims features. Thus, the claimed subject matter would not have been rendered obvious by the prior art.

**D. Conclusion**

For at least these reasons, the combination of applied references would not have rendered obvious claims 1 and 5. Claims 2-4 depend from claim 1 and claim 6 depends from claim 5 and, thus, also would not have been rendered obvious by the applied references for at

least the same reasons. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

## III. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of this application are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,

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JAO:MCB

Attachments:
Dissolved Oxygen Concentration Table
Request for Continued Examination
Petition for Extension of Time

Date: June 23, 2009

**OLIFF & BERRIDGE, PLC**
**P.O. Box 320850**
**Alexandria, Virginia 22320-4850**
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DEPOSIT ACCOUNT USE AUTHORIZATION
Please grant any extension necessary for entry;
Charge any fee due to our Deposit Account No. 15-0461

Table 1

| Dissolved oxygen concentration by oxygen partial pressure [%$O_2$] | Dissolved oxygen concentration by mass [ppm] | | A/B |
|---|---|---|---|
| | A: Edible oil (25°C) | B: Pure water (25°C) | |
| Saturated state under 1 atmospheric pressure 20.9 | 37.9 | 8.11 | 4.67 |
| 16.7 | 30.3 | 6.49 | 4.67 |
| 12.5 | 22.7 | 4.87 | 4.66 |
| 8.4 | 15.2 | 3.24 | 3.70 |
| 7.0 | 12.7 | 2.72 | 4.67 |
| 4.2 | 7.6 | 1.62 | 4.69 |
| 2.1 | 3.8 | 0.81 | 4.69 |
| 1.0 | 1.9 | 0.41 | 4.63 |
| 0.2 | 0.4 | 0.08 | 5.00 |